Response to Comments on Proposed National Pollutant Discharge Elimination System (NPDES) Permit for Leavenworth National Fish Hatchery WA 0001902

Comment 1 (from Washington Trout): The diversion structures in Icicle Creek associated with operation of the Leavenworth National Fish Hatchery (LNFH) adversely affect designated beneficial uses by decreasing flow and increasing temperature in the dewatered section of the Creek and by hindering fish migration. The issuance of the permit as drafted will not result in the attainment of water quality standards, because EPA unreasonably limited its review to the effects of the discharges and not a broader evaluation of the LNFH's activities. The permit does not contain sufficient conditions, as required by 40 CFR 122.44(d), that will result in attainment of water quality standards. EPA should withdraw this draft permit and reissue a new draft that takes into account the all of the operations of the LNFH.

Response 1: As required pursuant to Section 402 of the CWA and its implementing regulations, EPA has evaluated the discharge from LNFH and has established the appropriate limits/conditions to ensure that the discharge will not cause, have the reasonable potential to cause, or contribute to an excursion above the state water quality standards. Installation and operation of these diversion structures is not a discharge of pollutants subject to regulation by EPA in the NPDES permit.

It should be noted that operation of the LNFH diversion structures have been changed since the NPDES permit was proposed. Water is now being routed through the dewatered section of the stream to address fish habitat and passage issues. How these structures will be operated in the future is currently being evaluated and determined independent of this NPDES permit.

Comment 2 (from Washington Trout**)**: The commenter asks why the permit limitation proposed by EPA is different than the target level identified in Ecology's water quality evaluation of the Wenatchee River watershed. Ecology's evaluation identified that the phosphorus loading target for discharges from the Leavenworth NFH should be about 0.005 mg/l ortho-phosphorus. The permit proposes a limitation for total phosphorus of 0.010 mg/l.

Response 2: The 0.01 mg/l limitation for total phosphorus was determined by 1) translating Ecology's loading target for inorganic (ortho-) phosphorus to total phosphorus and 2) assuming that LNFH can manage its existing water rights to increase stream flow during the early part of the critical period and thereby create additional loading capacity. EPA utilized Ecology's water quality model for Icicle Creek to help determine this limitation. Additional information about EPA's calculation of this limitation is provided below.

Ecology's report (Wenatchee River Basin Dissolved Oxygen, pH and Phosphorus Total Maximum Daily Load Study, April 2006) identified that discharge of inorganic (ortho-) phosphorus during the critical low-flow period can affect water quality, specifically pH. This study determined that the water quality impacts measured at the mouth of Icicle Creek are a result of periphyton and algae growth in the stream. The main factors affecting this growth (and pH) are stream flow/depth, water temperature, and the nutrients available in the water to feed these organisms during the "critical" low-flow period. The critical period typically begins during the warm summer weather months after Icicle Creek flow declines in July and extends into September or early October.

Inorganic phosphorus is the readily bioavailable part of this nutrient that stimulates growth of periphyton and algae. The Ecology report estimated that the assimilative loading capacity for inorganic phosphorus loading in Icicle Creek to be about 0.65 kg/day *during critical conditions*. Loading in excess of this amount may cause pH at the mouth of Icicle Creek to exceed the water quality criteria for pH. During 2002 to 2004, the inorganic phosphorus discharged by the hatchery was measured by Ecology to be about 1.25 kg/day during the critical period. This loading must be reduced such that the assimilative capacity of the stream is not exceeded. Assuming that stream flow during critical conditions and that hatchery operation remained constant, the assimilative loading corresponds to a total phosphorus concentration target for the LNFH discharge of about 0.006 mg/l. Since essentially all of the flow in Icicle Creek is routed through the hatchery during the critical period, this is the target concentration for both the receiving water and the LNFH effluent.

A significant portion (almost 85 percent) of the total phosphorus in the LNFH discharge is in the form of inorganic phosphorus. Limitations for total phosphorus, rather than inorganic phosphorus, are proposed because the sample holding time and the analytical reporting levels for total phosphorus are more amenable for monitoring at very low concentrations. Some adjustment to the inorganic phosphorus loading target was necessary to translate it to a total phosphorus limitation. EPA did not presume any reduction of phosphorus loading from the nonpoint sources (such as the existing near-stream septic systems for businesses and residences) would occur in determining the total phosphorus limitation for LNFH. EPA also did not apply any dilution factor associate with a mixing zone, again because the discharge constitutes almost all the flow in Icicle Creek during the critical period.

Ecology's report emphasized that water quality in Icicle Creek and throughout the Wenatchee River watershed is adversely affected by water withdrawals which reduce stream flow during the critical period. Increasing stream flow during the critical period, combined with decreased pollutant loading from both point and nonpoint sources are necessary to improve water quality and habitat conditions in Icicle Creek. LHFH controls water rights to withdraw water from Snow Lake for hatchery operation. During the low flow period, the hatchery augments stream flow by routing cold water from Snow Lake into Icicle Creek upstream of the hatchery diversion. The hatchery also increases stream flow by pumping groundwater into the hatchery to augment the amount of water diverted from Icicle Creek. The net result is the LNFH discharge increases flow and decreases stream temperature in Icicle Creek during the critical period.

After discussing this situation with LNFH and Ecology staff, EPA believes that reducing the amount of total phosphorus discharged to less than 0.01 mg/l and increasing stream flow by alternative management of the Snow Lake diversion and groundwater wells (during the early portion of the critical period) could resolve the pH problems. The total phosphorus limitation is partially based on these presumptions. LNFH is also considering other changes to hatchery management and/or discharge options that may resolve compliance with pH criteria. Recent modeling of various flow scenarios confirmed this to be a reasonable assumption.

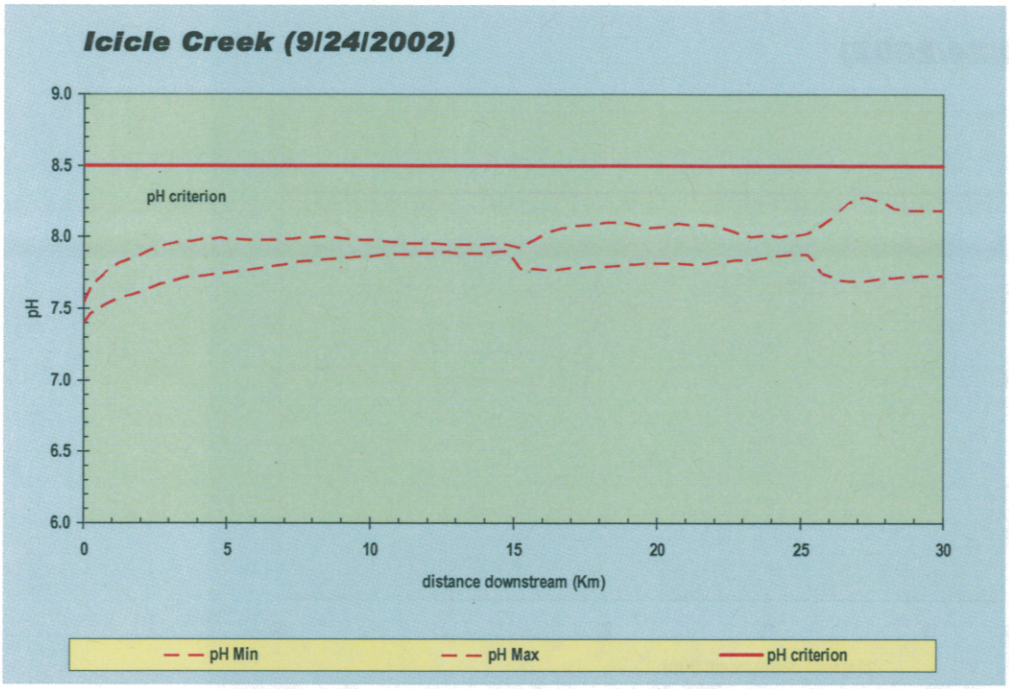

Figure 1. QUAL2K simulated daily minimum and maximum pH (dashed lines) with no hatchery diversion or discharge and no Snow Creek inflow and all flow going down the old channel (i.e., no hatchery presence).

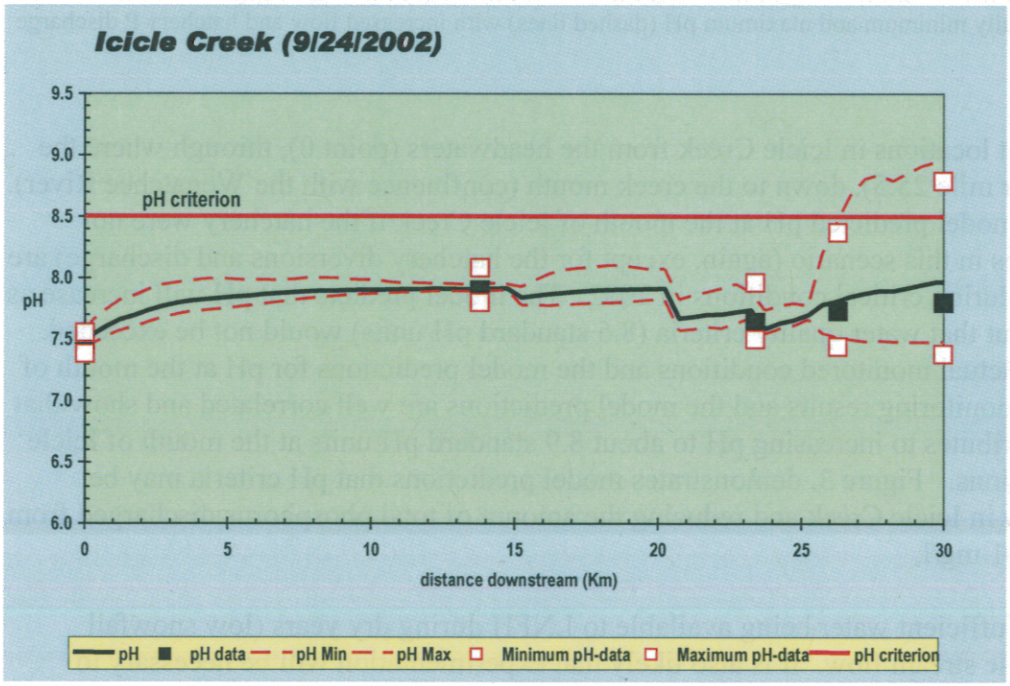

Figure 2. Comparison of QUAL2K simulated daily minimum and maximum pH (dashed lines) to observed daily minimum and maximum pH in Icicle Creek for September 2002 (i.e., with hatchery).

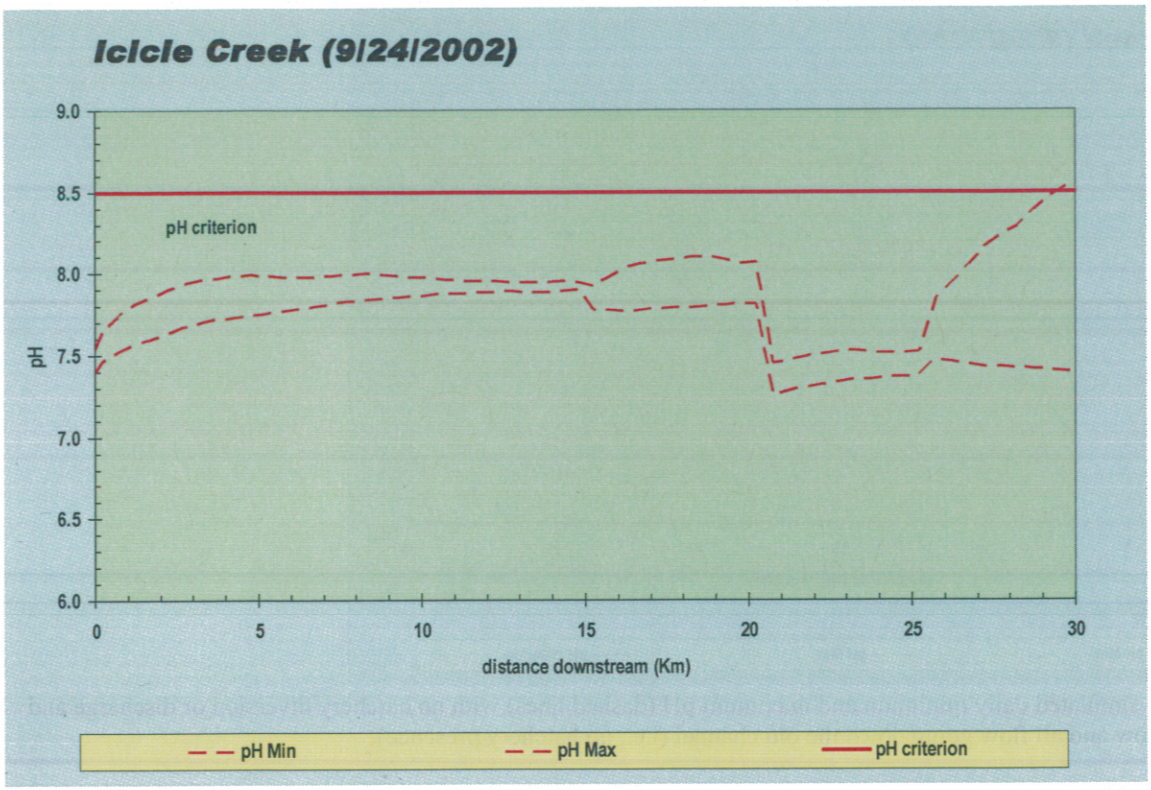

Figure 1. QUAL2K simulated daily minimum and maximum pH (dashed lines) with increased flow and hatchery P discharge at 0.01 mg/l.

The figures above plot pH at locations in Icicle Creek from the headwaters (point 0), through where the hatchery discharges (at river mile 25.5), down to the creek mouth (confluence with the Wenatchee River). Figure 1. demonstrates the model predicted pH at the mouth of Icicle Creek if the hatchery were not present. All other conditions in this scenario (again, except for the hatchery diversions and discharge) are the same as were observed during critical conditions in 2002. The model predicts that pH will increase as water travels downstream but that water quality criteria (8.5 standard pH units) would not be exceeded. Figure 2. demonstrates the actual monitored conditions and the model predictions for pH at the mouth of Icicle Creek in 2002. The monitoring results and the model predictions are well correlated and show that the hatchery discharge contributes to increasing pH to about 8.9 standard pH units at the mouth of Icicle Creek during critical conditions. Figure 3. demonstrates model predictions that pH criteria may be achieved by increasing flow in Icicle Creek and reducing the amount of total phosphorus discharged from the hatchery to less than 0.01 mg/l.

There is uncertainty about sufficient water being available to LNFH during dry years (low snowfall years) to sufficiently increase stream flow. It is also likely that experimentation will be necessary to determine the optimum timing for increasing stream flow to mitigate downstream pH problems. Modeling of various flow and discharge scenarios accompanied by monitoring to verify that the limitation for total phosphorus is protective of water quality will be conducted as the Wenatchee River Watershed TMDL for dissolved oxygen, pH and phosphorus is completed and implemented. If it is subsequently determined that a different limitation for total phosphorus is necessary to protect water quality, then it may be changed in accordance with provisions of 40 CFR 122.62.

Comment 3 (from LNFH):

LNFH representatives expressed concern that it is not possible to maintain fish production and also sufficiently reduce phosphorus in the discharge to meet the proposed 0.01 mg/l limitation.

Response 3:

EPA acknowledges that meeting the proposed total phosphorus limitation will be challenging. This is the most stringent limitation yet established for phosphorus for any discharge to waters of the United States. Reducing phosphorus loading to Icicle Creek must nevertheless be accomplished to address the existing water quality problems. The limitation for total phosphorus may increase or decrease as the result of the wasteload allocations that will be established in Ecology's TMDL for pollutants discharged by the LNFH and the other dischargers to the Wenatchee River watershed. As mentioned in Response 2 above, the 0.01 mg/l limitation is partially based on an assumption that flow in Icicle Creek can be increased during the early part of the critical period and thereby create additional capacity for phosphorus loading. It is not yet known how much of the phosphorus discharged in the hatchery effluent can be reduced by operational changes, enhanced best management practices and/or treatment of the effluent.

Comment 4 (from LNFH)**:**

The intake screen wash water that comprised discharge from Outfall 003 is no longer used and process wastewater is no longer discharged from this outfall. The permittee requested this outfall be eliminated from the permit.

Response 4:

Authorization to discharge process wastewater and associated limitations, monitoring and reporting requirements for Outfall 003 have been removed from the permit.

Comment 5 (from Ecology)**:**

The proposed permit does not include effluent limitations for chlorine as established for private and state hatcheries that operate in Washington under regulation by the state's NPDES general permit for fish hatcheries.

Response 5:

A chlorine limitation was not included in the proposed permit because LNFH does not use chlorine in their operation. After discussing this comment with LNFH it was decided that if an episodic fish disease event occurred that they would like to have the option to use chlorine if necessary. Accordingly, an end-of-pipe effluent limitation of 0.019 mg/l (no dilution factor) was added to the permit that is based on the Washington water quality criteria for chlorine. Requirements for monitoring during periods of chlorine use were also added to the permit.

Comment 6 (from Ecology)**:**

The proposed permit and fact sheet does not identify a mixing zone for the discharge(s). The pollutants discharged from a hatchery which have the greatest likelihood to affect water quality are ammonia, turbidity, dissolved oxygen, temperature and chemicals used for disease control and PCBs (which had been detected in the sediment of the pollution abatement pond). The permit does not include water quality-based effluent limitations for these parameters.

Response 6:

At the time this permit was proposed, the hatchery effluent during the critical period comprised essentially all of the flow in Icicle Creek downstream of the point of discharge. No mixing zone can be authorized in this situation and compliance with Washington water quality criteria was evaluated at the point of discharge from the hatchery. EPA determined that there is no *reasonable potential* that any of the pollutants potentially present in the discharge will cause or contribute to violations of water quality standards in the vicinity of the discharge. As mentioned in the fact sheet and in this response to comments, water quality-based limitations for phosphorus are being established to control a far field effect (at the mouth of Icicle Creek) of the discharge on pH. The ambient monitoring location identified in the proposed permit was also changed to require monitoring at the mouth of Icicle Creek. Limitations and monitoring requirements for chlorine were also added to the permit as discussed in Response 5.

Comment 7 (from Ecology)**:**

Although the permit includes essentially identical provisions as the Washington NPDES general permit for fish hatcheries regarding chemicals used for disease control, the permit does not require the permittee to submit records of such chemical use to EPA.

Response 7:

The permittee is required to maintain records of chemicals used for disease control and provide these records to EPA or the Washington Department of Ecology upon request.

Comment 8 (from Washington Trout):

The permit may need to be modified, revised or reissued as various changes to the water quality standards are approved by EPA.

Response 8:

If state water quality standards are changed EPA would determine whether the permit needed to be modified pursuant to 40 C.F.R. 122.62. Most permit are not modified before their expiration date, at which time a thorough evaluation to determine compliance with applicable water quality standards is conducted as part of the permit reissuance process.

Comment 9 (from Washington Trout):

No information is given in the application, the fact sheet, or the permit on frequency of cleaning the pollution abatement pond of accumulated solids.

Response 9:

LNFH staff report that all raceways are cleaned at least weekly. EPA does not dictate the frequency that hatchery operators clean rearing ponds and raceways. However, effluent limitations are established in the permit to control the discharge of solids removed during cleaning.

Comment 10 (from Washington Trout):

The intake dam's fish ladder is used to illegally flush sediment. There is no permit for this activity and the draft permit does not address this issue. EPA should condition this permit in order to prevent LNFH from using their fish ladder to illegally discharge sediment into Icicle Creek.

Response 10:

LNFH managers responded to EPA that the fish ladder is not operated to flush (discharge) sediment. Such activities, were they to occur, are not authorized by this NPDES permit.

Comment 11 (from Washington Trout):

Because of the discrepancy between Ecology's technical report and the effluent limitations in the draft permit, WA Trout requests a public hearing on the permit so that EPA can explain the derivation of the 0.010 mg/L effluent limitation for phosphorus.

Response 11:

40 C.F.R § 124.12(a) states that "[t]he Director shall hold a public hearing whenever he/she finds, on the basis of requests, a significant degree of public interest in a draft permit." Washington Trout was the only commentor who requested a public hearing. EPA has explained in the response to comments how the phosphorus limit was calculated. Therefore, EPA does not believe that there is a significant degree of interest in the permit to warrant a public hearing.

Comment 12 (from Washington Trout):

The permit does not address PCBs and other fish feed contaminants. EPA must condition this permit to require periodic maintenance of the pollution abatement system, including periodic cleaning of the pollution abatement pond. EPA should also direct LNFH to cooperate with Ecology in its TMDL study of PCBs and DDT in order to get a clearer picture of contamination.

Response 12:

As discussed in the Fact Sheet for this permit, the study of PCBs conducted by the US Fish and Wildlife Service for the LNFH provided the best available information about PCBs potentially present in the discharge. EPA found there to be no reasonable potential for the discharge to cause or contribute to violation of state water quality standards for this pollutant. Accordingly, no requirements for this pollutant are proposed. EPA anticipates LNFH will continue to cooperate with Ecology efforts to

evaluate PCBs and pesticides in the watershed. However, EPA does not have the authority to direct such action by LNFH.

Comment 13 (from Washington Trout):

The pollution abatement pond was constructed in 1986. This is the first NPDES permit issued since the construction of the pond. Therefore, this facility is a "new source" and the permit is subject to NEPA.

Response 13:

40 C.F.R. § 451.1 states that the ELGs apply to "discharges of pollutants from facilities that produce 100,000 pounds or more of aquatic animals per year…." LNFH does not produce 100,000 pounds or more of aquatic animals per year; therefore, the ELGs do not apply. 40 C.F.R. § 122.2 states defines new source as "any building, structure, facility, or installation from which there is or may be a discharge of pollutants, the construction of which commenced: (a) after promulgation of standards of performance under section 306 of the CWA which are applicable to such source, or (b) after proposal of standards or performance in accordance with section 306 of the CWA which are applicable to such source, but only if the standards are promulgated in accordance with section 306 within 120 days of their proposal." Here, there are no ELGs that are applicable to LNFH. Therefore, the facility is not a new source.

LNFH is still not a new source because the pollution abatement pond was not constructed at a site at which no other source was located; the pollution abatement pond processes are not substantially independent of an existing source at the site; and the pollution abatement pond does not totally replace the process or production equipment that causes the discharge of pollutants at LNFH. *See* 40 C.F.R. § 122.29.

Comment 14 (from Ecology):

The address listed in the proposed permit for Ecology's Central Regional Office is incorrect.

Response 14:

The address in the proposed permit was replaced with the one provided by Ecology.

Comment 15 (from Ecology):

Ecology suggested that the permit or Response to Comments should describe how the limitation for total phosphorus is calculated for the combined discharges from Outfalls 001 and 004.

Response 15:

Discharge flow and the total phosphorus concentration from outfalls 001 and 004 must be monitored as required by the permit to determine compliance with the limitation. This monitoring information is then used to determine the concentration of the total hatchery discharge by using the following simple formula:

Combined effluent concentration of total phosphorus = $\frac{(F1 \times C1) + (F4 \times C4)}{(F1 + F4)}$

Where F1 = flow at time of sample collection from Outfall 001
C1 = measured concentration (mg/l) of total phosphorus in outfall 001
F2 = flow at time of sample collection from Outfall 004
C4 = measured concentration (mg/l) of total phosphorus in outfall 004

Comment 16 (from LNFH):

The permittee is concerned that the proposed four year compliance schedule is too short a time to implement major construction activities if these are determined necessary to meet limitations for total phosphorus. Since the propose limitation is very stringent, it is likely to take more time than proposed by EPA to evaluate and design treatment technologies potentially capable of reducing phosphorus to these low levels and to then construct and begin operation of these facilities.

Response 16:

The compliance schedule represented EPA's estimate of a reasonable timeframe to evaluate the current operation, identify measures that can reduce phosphorus in the discharge, and to implement those measures. In developing the four year schedule that was included in the proposed permit, EPA did not assume that these measures would require major construction. The compliance schedule has been modified to provide one additional year to complete construction if the LNFH determines it to be necessary to achieve compliance with the phosphorus limitation.